WHAT IS CLAIMED IS:

1. A method for locating specimen regions of interest in a stimulatable microscopic specimen, comprising the following steps:
   - introducing into the specimen of at least two stimulation-specific stains that emit light of different wavelengths;
   - illuminating at least a portion of the specimen with at least one illuminating light beam;
   - initiating a stimulation;
   - detecting the light emerging from the stimulation-specific stains; and
   - identifying the spatial position of the regions within the portion of the specimen from which light of at least two different wavelengths that are emission wavelengths of the stimulation-specific stains is emerging.

2. The method as defined in Claim 1, wherein detecting the light emerging from the stimulation-specific stains is accomplished in temporal correlation with initiation of the stimulation.

3. The method as defined in Claim 1, wherein introducing of at least two stimulation-specific stains encompasses the introduction by genetic engineering of fluorescing proteins, in particular of GFP.

4. The method as defined in Claim 1, wherein the introducing of at least two stimulation-specific stains encompasses the introduction of indicators, in particular calcium indicators.

5. The method as defined in Claim 1, wherein stimulating comprises the application of an electrical voltage.

6. The method as defined in Claim 1, wherein illuminating of the specimen comprises, an illuminating light beam guided with a beam deflection device on a defined path over or through the specimen.

7. The method as defined in Claim 6, wherein data concerning the deflection position of the beam deflection device are used for identification of the spatial position of the regions within the specimen.

8. The method as defined in Claim 1, wherein the regions within the specimen are displayed to the user on a means for display.

9. The method as defined in Claim 1, wherein the specimen is a biological specimen, in particular a nerve cell tissue.

10. The method as defined in Claim 9, wherein the regions of interest are contact points between nerve cells.

11. The method as defined in Claim 1, wherein a scanning microscope, in particular a confocal scanning microscope, is used.

12. An apparatus for locating specimen regions of interest in a stimulatable microscopic specimen, comprising a means for illuminating at least a portion of the specimen with at least one illuminating light beam, a means for initiating a stimulation, a means for detecting the light emerging from the stimulation-specific stains; and means for identifying the spatial position of the regions within the specimen from which light of at least two different wavelengths that are emission wavelengths of the stimulation-specific stains is emerging.

13. The apparatus as defined in Claim 12, wherein a processing unit is provided that creates a temporal correlation between the signals furnished by the means for detection and the initiation of the stimulation.

14. The apparatus as defined in Claim 12, wherein the means for detection of the light emerging from the stimulation-specific stains comprise a multi-band detector.

15. The apparatus as defined in Claim 12, wherein means for applying an electrical voltage to at least part of the specimen are provided.

16. The apparatus as defined in Claim 12, wherein a beam deflection device that guides the illuminating light beam on a defined path over or through the specimen is provided.

17. The apparatus as defined in Claim 16, wherein a position sensor for ascertaining the deflection position of the beam deflection device is provided and the beam deflection device contains tiltable mirrors; and galvanometers that bring about the tilting of the mirrors.